



# Superfund At Work

## Hazardous Waste Cleanup Efforts Nationwide

### W.R. Grace Site Profile

**Site Description:** 260 acres in  
Acton, Massachusetts

**Primary Contaminants:** Vinylidene  
chloride, benzene, ethyl benzene,  
vinyl chloride, and bis(-2 ethylhexyl)  
phthalate

**Potential Range of Health Effects:**  
Increased risk of cancer, central  
nervous system disorders

**Nearby Population:** 20,000 people

**Ecological Concerns:** The Assabet  
River ecosystem; Sinking Pond and  
watershed

**Year Listed on NPL:** 1983

**EPA Region:** 1

**Congressional District:** 5

### *Success in Brief*

## Partnership Produces Measureable Results

Public support for environmental protection has grown over the past 25 years because of tangible results. Government and industry have made noteworthy progress in all areas partly because of corporate accountability bolstered by effective enforcement of laws and regulations.

Sometimes traditional controls give way to new strategies that take advantage of individual stewardship and voluntary action. When federal and state agencies work together with private companies and citizens, everyone has a voice. The faceless bureaucrats in business, industry, or government are no different from the people affected by a hazardous waste site: real men and women who raise children, go to work, and pay taxes. The same people who worked at the factory that caused the contamination, shop at the local grocery store. In the end, everyone has the same interest and working together is the only solution.

An example of a successful partnership was the one forged between the U.S. Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MADEP), the W.R. Grace Company, and the citizens and local government of Acton, MA. Town officials and local residents were heavily involved in the blueprint for cleanup at the site. Company representatives signed agreements that would span more than 15 years. EPA and MADEP learned important lessons in the value of public perspective. Alert citizens became versed in the topics of hazardous waste, ground water, air quality, and innovative technology. Most importantly, the environment now sustains a larger population of species for the greater cause of biodiversity.

## The Site Today

The aquifer restoration system installed by W.R. Grace in 1985 continues operating to reduce contaminant levels in ground water to federal standards. Excavation of 12 areas for a series of innovative soil treatments is under way in anticipation of the landfill cap construction. Treated wastes are scheduled to be capped in an on-site landfill during 1996.

**Building consensus** entailed hard work, patience, and trust.

## A Site Snapshot

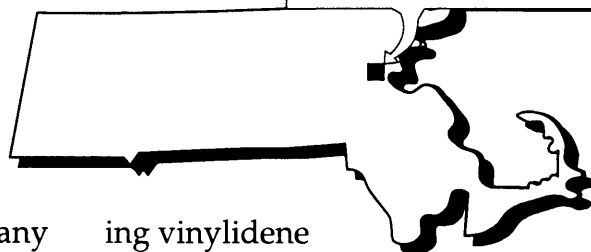
About 25 miles west of Boston, the W.R. Grace site extends over 260 acres of Acton, Massachusetts. The property is flanked in part by Fort Pond Brook and the Assabet River. A dozen schools, a nursing home, and 190 private homes are within two miles of the site boundaries. Approximately 20,000 people live in the Town of Acton.

The W.R. Grace Company owned and operated a factory here since 1954, producing sealing compounds, latex products, and battery separators. Prior to that, the site had been the location of other chemical companies that produced sealants for rubber containers, latex

products, plasticizers, and resins. Past disposal practices at the facility resulted in extensive soil, sediment, and ground water contamination.

Chemicals includ-

**W.R. Grace Site**  
Acton, Massachusetts

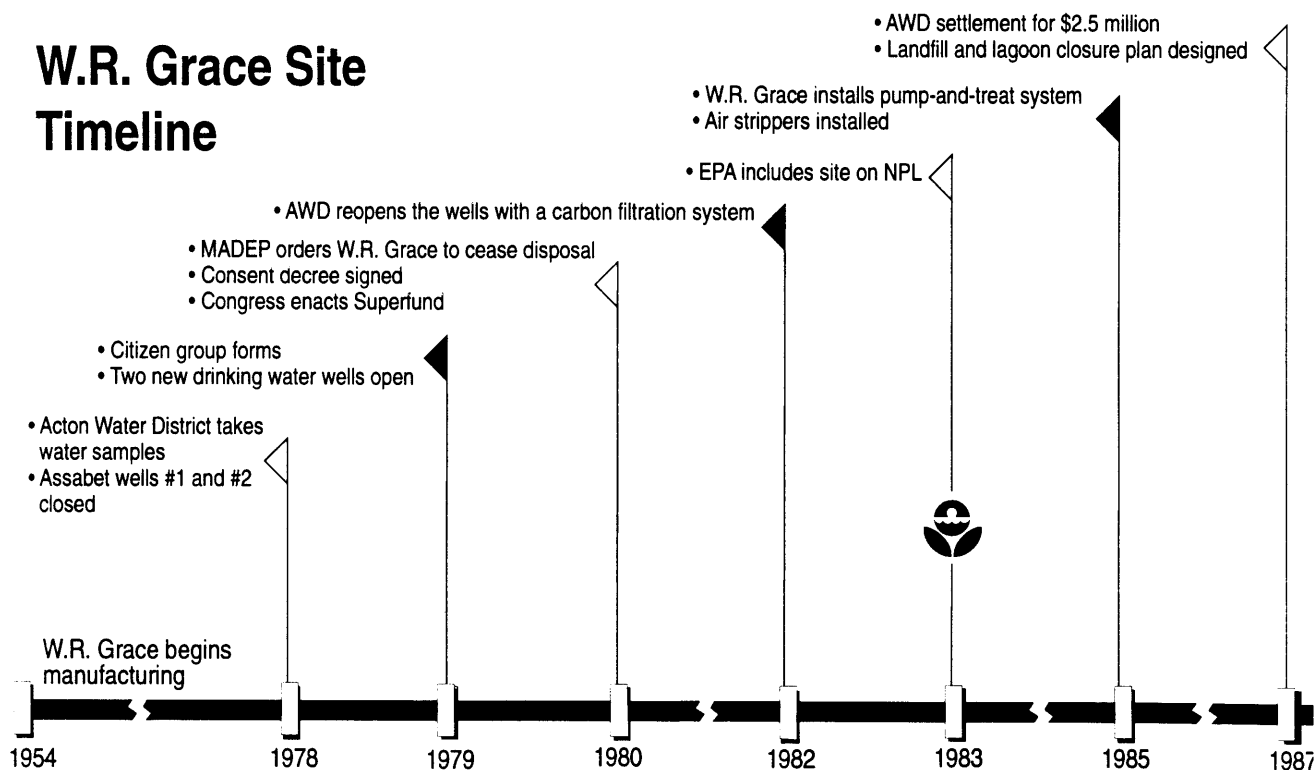


ing vinylidene chloride (VDC), benzene, and other volatile organic compounds (VOCs) leached from on-site landfills and unlined lagoons into the ground water. Two Acton water supply wells, Assabet #1 and #2, are within a quarter mile of the site to the south-

west. Surface water from Sinking Pond on the site feeds into the ground water aquifer that is the source for Assabet Wells #1 and #2, supplying 40 percent of Acton's drinking water.

The main contaminant, VDC, is a suspected carcinogen and has been shown to cause central nervous system dysfunctions. Some water samples revealed VDC concentrations in excess of 100 parts per billion (ppb); federal standards define acceptable levels as less than 7 ppb. To illustrate the potency of this chemical, seven parts per billion are comparable to seven kernels of corn in a filled, 45-foot silo, 16 feet in diameter.

## W.R. Grace Site Timeline



# Past Disposal Practices Jeopardize Drinking Water

Since 1954, three separate divisions of W.R. Grace have operated here, producing sealing compounds, latex products, and battery separators. In the early days, wastewater from manufacturing operations went untreated into a series of unlined lagoons on the site. Over time, chemicals in the effluent seeped into the ground, undetectable for more than 20 years. Because of the proximity of the facility to the town water supply wells, the Acton Water District (AWD) sampled the nearby ground water and wells in 1978. The samples revealed the presence of VDC and benzene in two of Acton's water supply wells.

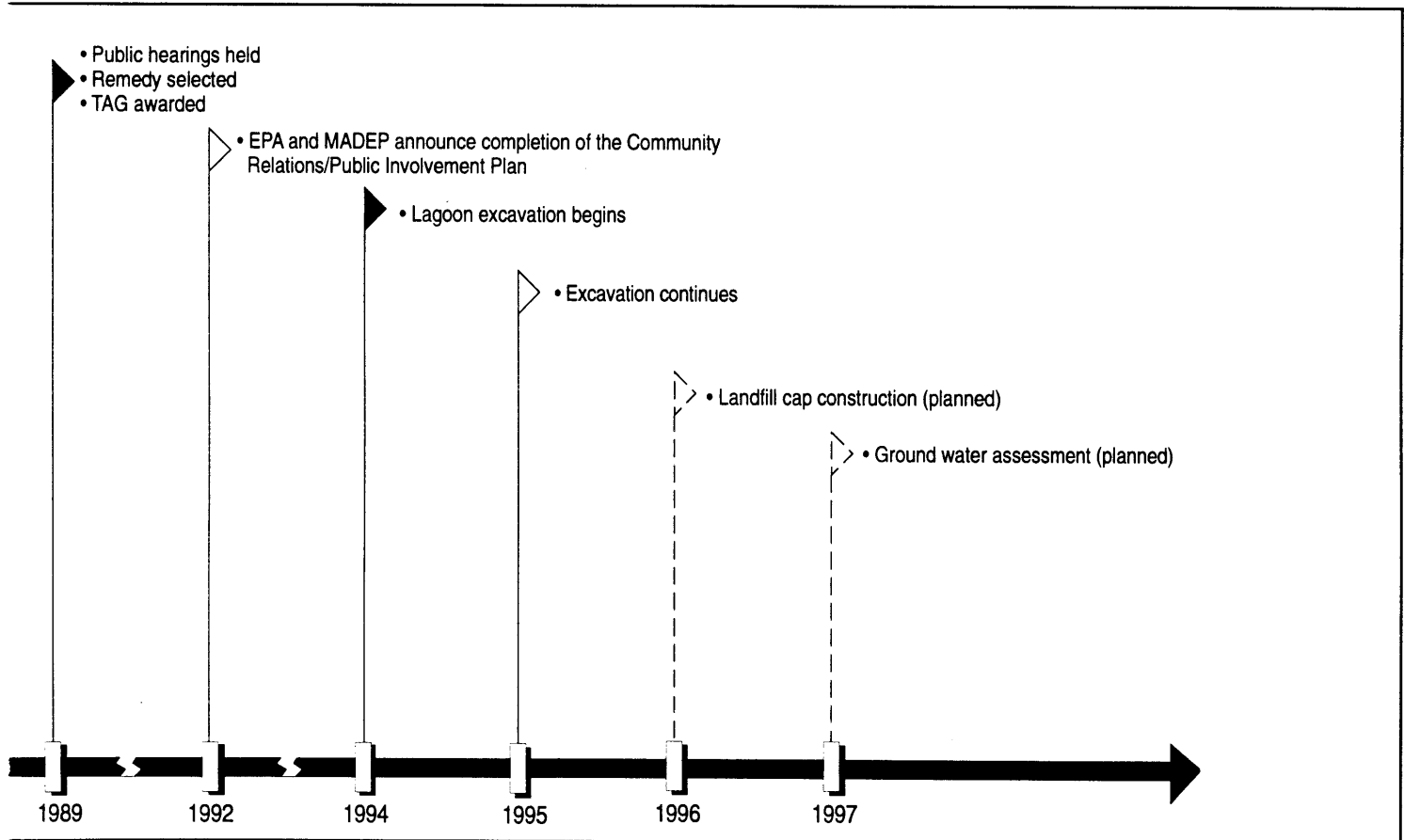
The discovery of contamination in the drinking water supply prompted the Town of Acton to close the wells. By 1979, the town had opened new wells to replace Assabet #1 and #2. The Town of Acton and the Massachusetts Department of Environmental Protection (MADEP) began investigating W.R. Grace's waste disposal practices to determine the extent of contamination in the municipal well field. Based on the findings, MADEP issued an order to W.R. Grace in July, 1980 to cease waste disposal practices and conduct a full site remediation program. The company complied with the state order, and by 1980 all

organic chemical operations at the site had ceased.

## Pre-Superfund Settlement Reduces Aquifer Contamination

In October 1980, two months prior to the passage of Superfund, EPA and W.R. Grace signed an agreement called a consent decree which outlined a framework for cleanup. The company agreed to fully restore the Sinking Pond aquifer and to design a phased cleanup program for on-site waste disposal areas. The consent decree also directed W.R. Grace to conduct investigations on the nature and extent

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of ground water contamination, to serve as EPA's scientific basis for comprehensive cleanup.

Two months later, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 authorizing the Superfund program. A primary purpose of the law was to remediate hazardous waste sites using private funding whenever possible. In 1983, EPA placed the W.R. Grace site on the National Priorities List (NPL), a roster of abandoned or uncontrolled hazardous waste sites requiring comprehensive cleanup. AWD also pursued the company for the costs of the well closure which W.R. Grace paid four years later.

EPA approved W.R. Grace's work plan for aquifer restoration in October 1984, and by 1985 the company had installed a ground water pump-and-treat system. Ten extraction wells pump contaminated ground water from beneath the waste disposal areas and an air-stripping tower extracts the contaminants. After treatment, the ground water is then discharged into nearby Sinking Pond. This system significantly slowed migration of pollutants to the aquifer. Toxic concentrations, which at one time exceeded 100 ppb, range from one to three ppb.

## Latex:



## Natural Chemical with Multiple Uses

Latex is a milky white juice found in several families of flowering plants such as the Para rubber tree of Brazil. One kind of natural latex known as chicle, once was widely used to make chewing gum. Another kind, gutta-percha, was used in making golf balls. The latex of the opium poppy is the source of opium and the alkaloid morphine.

In the paint and coatings industry, synthetic latex has come into widespread use since the late 1940s. Every paint contains a binder or resin which forms the film and holds the paint together. Latex is a specific type of binder with useful properties, such as protection of wood and masonry from all types of weather. Other properties include color and gloss retention, blister resistance, long-term flexibility, and ease of application. Spills, brushes, and hands clean up with soap and water. In the rubber industry, synthetic latex also is used to manufacture hundreds of items including tires, overshoes, and adhesives. The elasticity and toughness of latex ensure a long life for many products.

Today, manufacturers follow strict regulations on discharge of effluent or disposal of hazardous wastes generated during industrial processes. Many companies have gone beyond traditional waste control measures and practice pollution prevention by reducing the risks associated with toxic chemicals. Solvent substitution, product redesign, and equipment modification successfully reduce or eliminate hazardous waste.

### Landfill and Lagoon Closure Plan Under Way

Solid and hazardous wastes generated during various manufacturing processes had been disposed of in unlined lagoons and a landfill covering six acres. In cooperation with EPA, W.R. Grace conducted studies to determine the best approach to address contaminants found in the lagoons and landfill.

After examining several options, EPA selected a plan that involved excavating the sludge lagoons and mixing the wastes with fly ash, quick lime, and portland cement. This

mixture then enters a thermal desorption system that uses heat generated by the addition of lime to enhance the release of VOCs before the treated material is allowed to solidify. Emissions driven off during treatment are collected and treated by thermal oxidation. This technology uses a flare to burn and destroy the VOCs. Engineers will then transfer the solidified sludge to the on-site industrial landfill and install an impermeable cap with a high-density, polyethylene liner.

Specific cleanup standards are required for the contents of

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# Community Involvement Shapes Decisions for Cleanup Strategies

Every Superfund site has unique characteristics and so EPA tailors the remedy to "fit" not only the hazardous waste, but the people who live and work there. Who knows better than the folks in the area what some of the effects of a hazardous waste site have been? The local boys on their bikes riding home from school are the ones who see the fish kills. Mothers at home nursing their babies are the first to detect foul odors in the air. The retired couple out for a walk in the park will spot a fire and call the emergency preparedness network. Every day, average citizens from all walks of life detect changes in the environment and alert local officials.

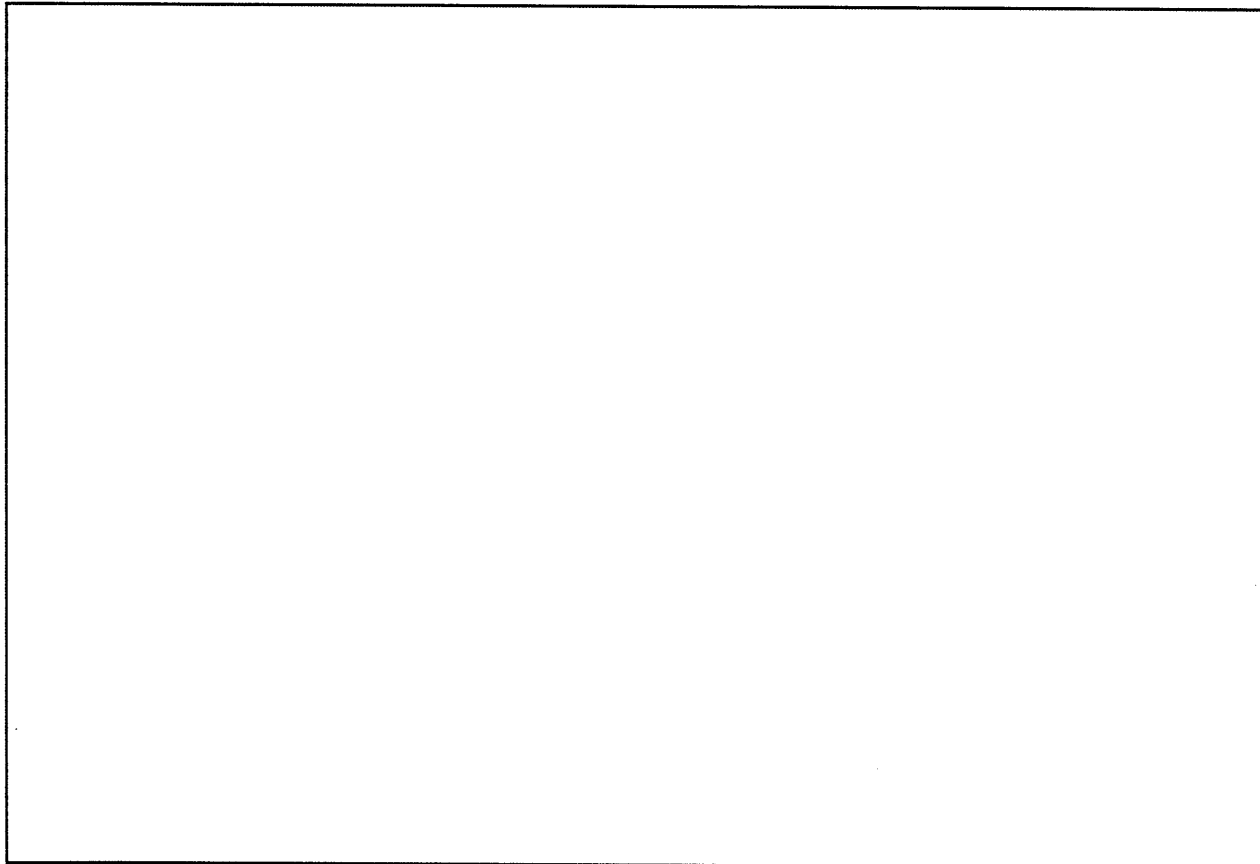
The Superfund law is unique in that public participation is both a requirement written into the law and a necessary component for the selection of remedy. To encourage citizen participation, the Superfund law requires public meetings so that questions and concerns can be addressed throughout the site cleanup process. Scientists, engineers, and technicians from a variety of disciplines can assemble site facts and details, but do they make sense? How does the decision EPA must make about the thoroughness and permanence of a remedy effect the people down the street or in future generations?

The Superfund program offers the flexibility to air different options or set aside timetables to accommodate specific community

requirements. At least two public comment periods are held during the remedial process. EPA provides construction activity updates, fact sheets, and notices of major milestones and events.

In the small Town of Acton, citizen involvement was exceptionally high and helped EPA and MADEP reach decisions that were appropriate for the community. EPA and state officials welcomed the opinions and the testimonials of residents who came to public meetings or wrote their ideas down on paper. Without this local expression, government officials would have had to act in a vacuum, not fully appreciating what was important to the people who live there.

Photo credit: Steve Delaney, U.S. EPA



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each of the lagoons. To meet these standards, adjustments have had to be made to excavate deeper or require treatment in others; a solid mat heavily contaminated with benzene in the boiler lagoon was sent to a licensed hazardous waste incinerator instead. Excavation is currently under way, and work on the landfill cap is scheduled for 1996.

### Technical Assistance Grant Awarded

The Acton community was initially unsure about EPA's selected remedy and expressed concern that landfilling the hazardous waste would merely hide, rather than permanently eliminate, the waste. At public meetings, community members asked EPA to delay the selection of remedy so residents could apply for a Technical Assistance Grant (TAG). In 1989, EPA

awarded a TAG to the Acton Citizens for Environmental Safety (ACES). ACES then used the funds to hire a technical advisor to review EPA's technical approach to the site and to make recommendations on behalf of local residents. The advisor monitors the removal and treatment of contaminants at the site.

## Success at W.R. Grace

Discovery of contamination in ground water led to the closure of both municipal wells and the factory almost 15 years ago. The drinking water supply for the Town of Acton was replaced many times faster than the restoration of the aquifer. But 10 years of ground water treatment have reduced contaminant levels to near federal standards. Construction efforts to excavate and solidify 12 distinct areas used for hazardous waste disposal are under way. In 1996, a landfill cap will be installed over the immobilized mass of industrial waste. Citizen awareness, corporate responsibility, effective enforcement, and state oversight all contributed to the successful remediation of this site.

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